

SIMATIC

S7-1500/ET 200MP PS 25W 24 V DC power supply module (6ES7505-0KA01-0AB0)

Equipment Manual

Introduction

1

Industrial cybersecurity

2

Product overview

3

Wiring

4

Power Meter

5

Parameters

6

Interrupts, diagnostic alarms,
error and status messages

7

Compatibility

8

Technical specifications

9

Dimensional drawing

A

Parameter data record

B

Approvals

C

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified persons are those who, because of their training and experience, are familiar with the installation, assembly, commissioning, operation, decommissioning and disassembly of the product and can recognize risks and avoid possible hazards.

Proper use of Siemens products

Note the following:

WARNING

Siemens products may only be used for the application described in the catalog and the associated usage information. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens Aktiengesellschaft. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Table of contents

1	Introduction.....	5
1.1	Documentation guide.....	6
1.1.1	Information classes S7-1500/ET 200MP.....	6
1.1.1.1	S7-1500/ET 200MP documentation guide.....	6
1.1.2	Basic tools.....	8
1.1.3	SIMATIC Technical Documentation.....	10
2	Industrial cybersecurity.....	13
2.1	Introduction to industrial cybersecurity.....	13
2.2	Cybersecurity information.....	13
2.3	Note on IT security.....	14
2.4	Open Source Software.....	14
2.5	Cybersecurity-relevant information.....	15
3	Product overview.....	16
3.1	Properties.....	16
3.2	New functions.....	18
3.3	Control and display elements.....	18
4	Wiring.....	19
4.1	Connecting the supply voltage (PS 25W 24VDC).....	19
5	Power Meter.....	22
5.1	Reporting on power information.....	22
5.2	Detection and reporting of abnormal voltages on the 24 V input line.....	22
5.3	Detection and reporting of interference voltages on the 24 V input line.....	23
6	Parameters.....	24
6.1	Parameters.....	24
7	Interrupts, diagnostic alarms, error and status messages.....	25
7.1	Interrupts.....	25
7.2	Diagnostic alarms.....	26
7.3	Status and error displays.....	28
8	Compatibility.....	29
8.1	Compatibility of modules.....	29
9	Technical specifications.....	30

A Dimensional drawing..... 32

 A.1 Dimensional drawing..... 32

B Parameter data record..... 34

 B.1 Data record 15 (read)..... 35

 B.2 Data record 16 (read)..... 36

 B.3 Data record 17 (read)..... 38

 B.4 Time stamp data structure..... 40

C Approvals..... 41

 C.1 Approvals..... 41

Index..... 45

Introduction

Purpose of this documentation

This Equipment Manual supplements these System Manuals:

- Automation system S7-1500/ ET 200MP
- SIMATIC S7-1500 S7-1500R/H redundant system
(<https://support.industry.siemens.com/cs/ww/en/view/109754833>)

Functions that concern the systems in general are described in these manuals.

The information in this Equipment Manual along with the System Manuals/Function Manuals will enable you to commission your systems.

Conventions

The term "CPU" as used in this manual refers to both the central modules of the S7-1500 automation system and to the interface modules of the ET 200MP distributed I/O system.

Please observe notes labeled as follows:

NOTE

A note contains important information about the product described in the documentation and its use, or about a specific section of the documentation to which you should pay particular attention.

Recycling and waste disposal

For environmentally sustainable recycling and waste disposal of your old equipment, contact a certified electronic waste disposal company and dispose of the equipment according to the applicable regulations in your country.

See also

S7-1500 automation system
(<http://support.automation.siemens.com/WW/view/en/59191792>)

1.1 Documentation guide

1.1.1 Information classes S7-1500/ET 200MP

1.1.1.1 S7-1500/ET 200MP documentation guide



The documentation for the SIMATIC S7-1500 automation system and the ET 200MP distributed I/O system is arranged into three areas.

This arrangement enables you to access the specific content you require. Changes and supplements to the manuals are documented in a Product Information.

You can download the documentation free of charge from the Internet (<https://support.industry.siemens.com/cs/ww/en/view/109742691>).

Basic information



The System Manual and Getting Started describe in detail the configuration, installation, wiring and commissioning of the SIMATIC S7-1500 and ET 200MP systems.

The STEP 7 online help supports you in the configuration and programming.

Examples:

- Getting Started S7-1500
- S7-1500/ET 200MP System Manual
- Online help TIA Portal

Device information



Equipment manuals contain a compact description of the module-specific information, such as properties, wiring diagrams, characteristics and technical specifications.

Examples:

- Equipment Manuals CPUs
- Equipment Manuals Interface Modules
- Equipment Manuals Digital Modules
- Equipment Manuals Analog Modules
- Equipment Manuals Communications Modules
- Equipment Manuals Technology Modules
- Equipment Manuals Power Supply Modules

General information



The function manuals contain detailed descriptions on general topics relating to the SIMATIC S7-1500 and ET 200MP systems.

Examples:

- Function Manual Diagnostics
- Function Manual Communication
- Function Manual Motion Control
- Function Manual Web Server
- Function Manual Cycle and Response Times
- PROFINET Function Manual
- PROFIBUS Function Manual

Product Information

Changes and supplements to the manuals are documented in a Product Information. The Product Information takes precedence over the device and system manuals.

You can find the latest Product Information on the S7-1500 and ET 200MP systems on the Internet (<https://support.industry.siemens.com/cs/ww/en/view/68052815>).

Manual Collection S7-1500/ET 200MP

The Manual Collection contains the complete documentation on the SIMATIC S7-1500 automation system and the ET 200MP distributed I/O system gathered together in one file.

You can find the Manual Collection on the Internet.

(<https://support.industry.siemens.com/cs/ww/en/view/86140384>)

Manual Collection fail-safe modules

The Manual Collection contains the complete documentation on the fail-safe SIMATIC modules, gathered together in one file.

You can find the Manual Collection on the Internet.

(<https://support.industry.siemens.com/cs/ww/en/view/109806400>)

SIMATIC S7-1500 comparison list for programming languages

The comparison list contains an overview of which instructions and functions you can use for which controller families.

You can find the comparison list on the Internet

(<https://support.industry.siemens.com/cs/ww/en/view/86630375>).

1.1.2 Basic tools

Tools

The tools described below support you in all steps: from planning, over commissioning, all the way to analysis of your system.

TIA Selection Tool

The TIA Selection Tool tool supports you in the selection, configuration, and ordering of devices for Totally Integrated Automation (TIA).

As successor of the SIMATIC Selection Tools, the TIA Selection Tool assembles the already known configurators for automation technology into a single tool.

With the TIA Selection Tool, you can generate a complete order list from your product selection or product configuration.

You can find the TIA Selection Tool on the Internet.

(<https://support.industry.siemens.com/cs/ww/en/view/109767888>)

SIMATIC Automation Tool

You can use the SIMATIC Automation Tool to perform commissioning and maintenance activities on various SIMATIC S7 stations as bulk operations independent of TIA Portal.

The SIMATIC Automation Tool offers a wide range of functions:

- Scanning of a PROFINET/Ethernet system network and identification of all connected CPUs
- Assignment of addresses (IP, subnet, Gateway) and device name (PROFINET device) to a CPU
- Transfer of the date and the programming device/PC time converted to UTC time to the module
- Program download to CPU
- RUN/STOP mode switchover
- CPU localization through LED flashing
- Reading out of CPU error information
- Reading the CPU diagnostic buffer
- Reset to factory settings
- Firmware update of the CPU and connected modules

You can find the SIMATIC Automation Tool on the Internet.

(<https://support.industry.siemens.com/cs/ww/en/view/98161300>)

PRONETA

SIEMENS PRONETA (PROFINET network analysis) is a commissioning and diagnostic tool for PROFINET networks. PRONETA Basic has two core functions:

- In the network analysis, you get an overview of the PROFINET topology. Compare a real configuration with a reference installation or make simple parameter changes, e.g. to the names and IP addresses of the devices.
- The "IO test" is a simple and rapid test of the wiring and the module configuration of a plant, including documentation of the test results.

You can find SIEMENS PRONETA Basic on the Internet:

(<https://support.industry.siemens.com/cs/ww/en/view/67460624>)

SIEMENS PRONETA Professional is a licensed product that offers you additional functions. It offers you simple asset management in PROFINET networks and supports operators of automation systems in automatic data collection/acquisition of the components used through various functions:

- The user interface (API) offers an access point to the automation cell to automate the scan functions using MQTT or a command line.
- With PROFlenergy diagnostics, you can quickly detect the current pause mode or the readiness for operation of devices that support PROFlenergy and change these as needed.
- The data record wizard supports PROFINET developers in reading and writing acyclic PROFINET data records quickly and easily without PLC and engineering.

You can find SIEMENS PRONETA Professional on the Internet.

(<https://www.siemens.com/proneta-professional>)

SINETPLAN

SINETPLAN, the Siemens Network Planner, supports you in planning automation systems and networks based on PROFINET. The tool facilitates professional and predictive dimensioning of your PROFINET installation as early as in the planning stage. In addition, SINETPLAN supports you during network optimization and helps you to exploit network resources optimally and to plan reserves. This helps to prevent problems in commissioning or failures during productive operation even in advance of a planned operation. This increases the availability of the production plant and helps improve operational safety.

The advantages at a glance

- Network optimization thanks to port-specific calculation of the network load
- Increased production availability thanks to online scan and verification of existing systems
- Transparency before commissioning through importing and simulation of existing STEP 7 projects
- Efficiency through securing existing investments in the long term and the optimal use of resources

You can find SINETPLAN on the Internet

(<https://new.siemens.com/global/en/products/automation/industrial-communication/profinet/sinetplan.html>).

1.1.3 SIMATIC Technical Documentation

Additional SIMATIC documents will complete your information. You can find these documents and their use at the following links and QR codes.

The Industry Online Support gives you the option to get information on all topics. Application examples support you in solving your automation tasks.

Overview of the SIMATIC Technical Documentation

Here you will find an overview of the SIMATIC documentation available in Siemens Industry Online Support:



Industry Online Support International

(<https://support.industry.siemens.com/cs/ww/en/view/109742705>)

Watch this short video to find out where you can find the overview directly in Siemens Industry Online Support and how to use Siemens Industry Online Support on your mobile device:



Quick introduction to the technical documentation of automation products per video (<https://support.industry.siemens.com/cs/us/en/view/109780491>)



YouTube video: Siemens Automation Products - Technical Documentation at a Glance (<https://youtu.be/TwLSxxRQsA>)

Retention of the documentation

Retain the documentation for later use.

For documentation provided in digital form:

1. Download the associated documentation after receiving your product and before initial installation/commissioning. Use the following download options:
 - Industry Online Support International: (<https://support.industry.siemens.com>)
The article number is used to assign the documentation to the product. The article number is specified on the product and on the packaging label. Products with new, non-compatible functions are provided with a new article number and documentation.
 - ID link:
Your product may have an ID link. The ID link is a QR code with a frame and a black frame corner at the bottom right. The ID link takes you to the digital nameplate of your product. Scan the QR code on the product or on the packaging label with a smartphone camera, barcode scanner, or reader app. Call up the ID link.
2. Retain this version of the documentation.

Updating the documentation

The documentation of the product is updated in digital form. In particular in the case of function extensions, the new performance features are provided in an updated version.

1. Download the current version as described above via the Industry Online Support or the ID link.
2. Also retain this version of the documentation.

mySupport

With "mySupport" you can get the most out of your Industry Online Support.

Registration	You must register once to use the full functionality of "mySupport". After registration, you can create filters, favorites and tabs in your personal workspace.
Support requests	Your data is already filled out in support requests, and you can get an overview of your current requests at any time.
Documentation	In the Documentation area you can build your personal library.
Favorites	You can use the "Add to mySupport favorites" to flag especially interesting or frequently needed content. Under "Favorites", you will find a list of your flagged entries.
Recently viewed articles	The most recently viewed pages in mySupport are available under "Recently viewed articles".
CAX data	The CAX data area gives you access to the latest product data for your CAX or CAE system. You configure your own download package with a few clicks: • Product images, 2D dimension drawings, 3D models, internal circuit diagrams, EPLAN macro files • Manuals, characteristics, operating manuals, certificates • Product master data

You can find "mySupport" on the Internet. (<https://support.industry.siemens.com/My/ww/en>)

Application examples

The application examples support you with various tools and examples for solving your automation tasks. Solutions are shown in interplay with multiple components in the system - separated from the focus on individual products.

You can find the application examples on the Internet.
(<https://support.industry.siemens.com/cs/ww/en/ps/ae>)

AI-powered online support chat

The "AskSUPport" function is an advanced AI-controlled platform that gives you access to the powerful knowledge base of the Siemens Support Portal (<https://sieportal.siemens.com/en-de/support>). You do not just receive mechanical answers to your questions, but precise, interactive informational material. This allows you to effectively speed up your research and decision processes.

The following link (<https://support.industry.siemens.com/cs/ww/en/view/109974274>) provides current information on the availability of AskSUPport:

You can also access the entry by means of the "AI powered Online Support Chat" command in the "Help" menu in TIA Portal.

Industrial cybersecurity

2.1 Introduction to industrial cybersecurity

Due to the digitalization and increasing networking of machines and industrial plants, the risk of cyber attacks is also growing. Appropriate protective measures are therefore mandatory, particularly in the case of critical infrastructure facilities.

Refer to the System Manual for general information and measures regarding industrial cybersecurity.

This section provides an overview of security-related information pertaining to your SIMATIC device.

2.2 Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial cybersecurity measures that may be implemented, please visit
<https://www.siemens.com/cybersecurity-industry>.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Cybersecurity RSS Feed under
<https://www.siemens.com/cert>.

2.3 Note on IT security

Siemens offers IT security mechanisms for its automation and drive product portfolio in order to support the safe operation of the plant/machine. We recommend that you inform yourself regularly on the IT security developments regarding your products. You can find information on this on the Internet (<http://support.automation.siemens.com>).

You can register for a product-specific newsletter here.

For the safe operation of a plant/machine, however, it is also necessary to integrate the automation components into an overall IT security concept for the entire plant/machine, which corresponds to the state-of-the-art IT technology. You can find information on this on the Internet (<http://www.siemens.com/industrialsecurity>).

Products used from other manufacturers should also be taken into account here.

2.4 Open Source Software

This product, solution or service ("Product") contains third-party software components. These are either open source software licensed under a license recognized by the Open Source Initiative (<https://opensource.com/>) or a license defined by Siemens as comparable ("OSS") and/or commercial software or freeware. With respect to the OSS components, the applicable OSS license conditions prevail over any other terms and conditions covering the Product. The OSS portions of this Product are provided royalty-free and can be used at no charge.

You can download the OSS sources via SIOS.

The Readme_OSS and the OSS sources are always available for download on the SIOS page together with the firmware update.

This product contains software developed by the University of California, Berkeley, and its contributors.

If SIEMENS has combined or linked certain components of the Product with/to OSS components licensed under the GNU LGPL version 2 or later as per the definition of the applicable license, and if use of the corresponding object file is not unrestricted ("LGPL Licensed Module", whereas the LGPL Licensed Module and the components that the LGPL Licensed Module is combined with or linked to is the "Combined Product"), the following additional rights apply, if the relevant LGPL license criteria are met: (i) you are entitled to modify the Combined Product for your own use, including but not limited to the right to modify the Combined Product to relink modified versions of the LGPL Licensed Module, and (ii) you may reverse-engineer the Combined Product, but only to debug your modifications. The modification right does not include the right to distribute such modifications and you shall maintain in confidence any information resulting from such reverse-engineering of a Combined Product.

Certain OSS licenses require SIEMENS to make source code available, for example, the GNU General Public License, the GNU Lesser General Public License and the Mozilla Public License. If such licenses are applicable and this Product is not shipped with the required source code, a copy of this source code can be obtained by anyone in receipt of this information during the period required by the applicable OSS licenses by contacting the following address:

Siemens Aktiengesellschaft
Attn: Software Licensing
LC TEC IT&SL
Hertha-Sponer-Weg 3

91058 Erlangen
Germany

Keyword: Open Source Request (please specify Product name and version, if applicable)

SIEMENS may charge a processing fee for the fulfillment of the request.

Warranty regarding further use of the Open Source Software

SIEMENS' warranty obligations are set forth in your agreement with SIEMENS. If you modify the product or the OSS components or use them in a way other than that specified by SIEMENS, the warranty will be voided and no technical support will be provided. The following license terms may contain limitations of liability that apply between you and the respective licensor. For the avoidance of doubt, SIEMENS does not make any warranty commitment on behalf of or binding upon any third-party licensor. The Open Source Software used in the product and the license agreements concerning this software can be found in the Readme_OSS.

2.5 Cybersecurity-relevant information

Observe all relevant cybersecurity information.

Security features of the product	Reference
Signed firmware update	The topic of signed firmware updates is described in the Industrial cybersecurity section of the System Manual.

Product overview

3.1 Properties

Order number

6ES7505-0KA01-0AB0

View of the module

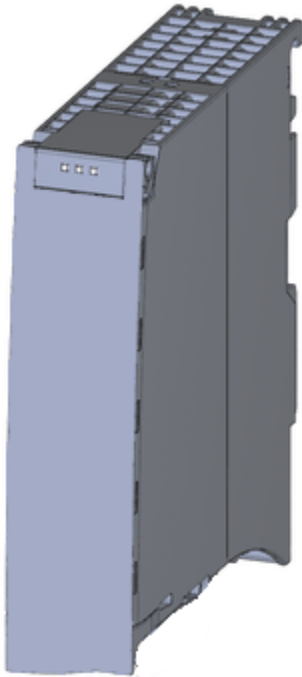


Figure 3-1 View of the PS 25W 24VDC module

Properties

The PS 25W 24VDC power supply module permits the use of additional modules.

The power supply module has the following properties:

- Technical properties
 - Rated input voltage 24 V DC (SELV)
 - Output power 25 W
 - Mains buffering
 - Functional electrical isolation from the bus

The module supports the following functions:

Table 3-1 Version dependencies of the module functions

Function	Firmware version of the module	Configuration software	
		STEP 7 (TIA Portal) as of V18/19 HSP0458	GSD file in STEP 7 (TIA Portal) as of V18/19 HSP 0458
Signed firmware update	V2.0.0 or higher	X	X (PROFINET IO only)
Identification data I&M0 to I&M3	V2.0.0 or higher	X	X (PROFINET IO only)
Parameter assignment in RUN	V2.0.0 or higher	X	X (PROFINET IO only)
Diagnostics interrupts	V2.0.0 or higher	X	X (PROFINET IO only)
Power Meter	V2.0.0 or higher	X (PROFINET IO only)	X (PROFINET IO only)

Accessories

The following components are supplied with the power supply module:

- Power connector
- U connector
- Front cover

These components are also available as spare parts.

3.2 New functions

Power Meter Function

The power supply module disposes of the Power Meter function. The Power Meter has 3 functions.

Function	Description	More information
Power monitoring	Detection of power information on the input cable (voltage, current, and power)	You can find more information here (Page 22) .
Voltage monitoring	Detection of abnormal voltages on the input cable	You can find more information here (Page 22) .
Frequency disturbance monitoring	Detection of frequency disturbances on the input cable	You can find more information here (Page 23) .

3.3 Control and display elements

The following figure shows the control and connection elements of the PS 25W 24VDC behind the front cover as well as the power connector.

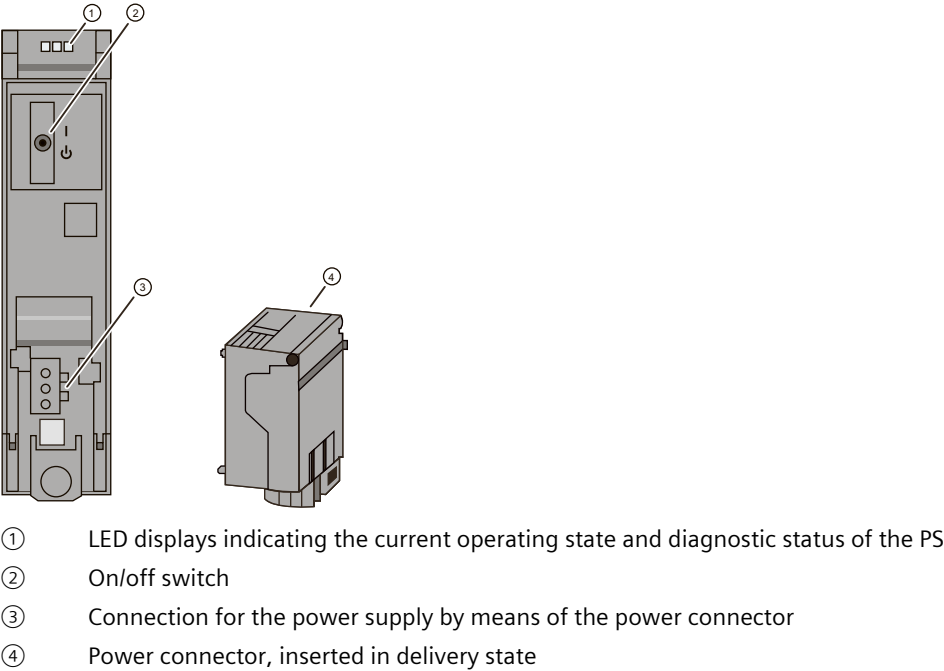


Figure 3-2 View of the PS 25W 24VDC (without front cover) and of the power connector

Wiring

4.1 Connecting the supply voltage (PS 25W 24VDC)

This section contains information on connecting the power supply module to the mains voltage.

Mains connection

WARNING
--

Installation instructions

Risk of death or serious injury.

Observe the general installation instructions applicable in your country when wiring the power supply module.

Fuse the power cables according to their conductor cross-section.

The following applies to mains connection of the power supply module using the power connector:

- The power connector enables connection of the input voltage to the power supply module with touch protection.
- The power connector enables permanent wiring.
- The power connector features internal strain relief.
- The power connector ensures reverse polarity protection. A coding element assigns each power connector to a specific type of power supply module on delivery. A connector coded for 230 V AC does not fit in the connection to a 24 V DC power supply module.

DANGER

Do not manipulate or omit the coding element

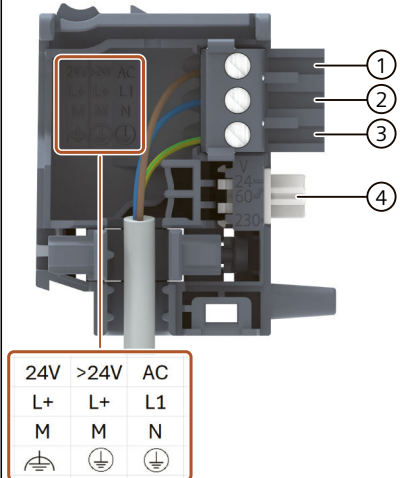
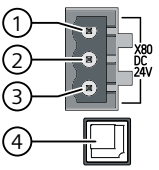
Changes to the coding element can result in dangerous states in your plant and/or damage to the outputs of the I/O modules. In order to avoid damage, do not manipulate the coding. The coding element may not be omitted.
--

4.1 Connecting the supply voltage (PS 25W 24VDC)

Connection plug

The connection plug for the power supply is plugged in when the power supply module ships from the factory.

The following figure shows the assignment of the connection plug:

Connector	PS connection	Name
		① L ② M ③ Functional earthing conductor ④ Coding element

Cables

You need flexible cables to wire power to the power supply module. The conductor cross-section must be 1.5 mm² (AWG: 16). The diameter of a 3 x 1.5 mm² sheathed cable can be no more than 8.5 mm. The external fusing must meet the requirements of the corresponding control cabinet.

 **DANGER**

Input voltage
Risk of death or serious injury.
The input voltage of the PS 25W 24VDC must be supplied as safety extra low voltage (SELV).

 **CAUTION**

Use copper cables on connectors with terminal connections.
Use only copper cables (Cu) for all signal and supply lines that are connected to the device via terminals, e.g. 24 V DC power supply cable to the 24 V DC power supply connections.

The tightening torque (input terminal) is 0.56 Nm

Reference

You can find more information about wiring the mains connector in the S7-1500 automation system (<https://support.industry.siemens.com/cs/de/de/view/59191792/en>) System Manual.

Siemens recommends the use of devices from the SITOP family of products for applications with load current supplies. Information on wiring is available in the load current supply documentation.

Power Meter

The Power Meter function supports you in the following tasks:

- Reporting on power information
- Detection and reporting of abnormal voltages on the 24 V input cable
- Detection and reporting of interference frequencies on the 24 V input cable

The power monitoring function supports you in the statistical analysis of power consumption and helps you with data acquisition and data provision on the way to CO₂ neutrality. The abnormal condition monitoring function can detect fluctuations and anomalies in the power supply in advance. This enables early intervention and diagnostics to ensure continuous and stable operation of the system.

5.1 Reporting on power information

The power monitoring function records the measured voltage, current and power values every 1 ms.

Power information via a data record

Data record 15 contains 3 elements for the power information:

- Power
- Voltage
- Current

If the CPU requests power information via data record 15, the current data is output by the power supply module. You can find more information on the structure of data record 15 here [\(Page 35\)](#).

5.2 Detection and reporting of abnormal voltages on the 24 V input line

Diagnostics interrupt for abnormal voltage

The diagnostics interrupt is disabled in the default configuration. You can enable/disable this function in STEP 7, in the hardware configuration. The following applies only if this function is enabled.

If the voltage is lower than 19.2 V DC or higher than 28.8 V DC, an abnormal voltage is detected. If the function is enabled, the event ID is sent to the CPU as an interrupt.

- If the "Supply voltage too low" was triggered, the diagnosis only disappears if the input voltage amounts to more than 19.5 V.
- If the "Supply voltage too high" was triggered, the diagnosis only disappears when the input voltage amounts to less than 28.5 V.

You can find more information in Table 7-2 [\(Page 26\)](#).

Information about abnormal voltages

You can call up information about abnormal voltages via data record 16. You can find more information on the structure of data record 16 here [\(Page 36\)](#).

5.3 Detection and reporting of interference voltages on the 24 V input line

The power supply module continuously reports all interference frequencies on the power input cable in the range 10–400 Hz. The existing interference frequency can impair the normal operation of the device. Check or eliminate the interference frequency on the current input line.

Interference frequency reports via a data record

You can call up the data on the interference frequency via data record 17. The last 5 entries are returned for a query of data record 17. You can find more information on the structure of data record 17 here [\(Page 38\)](#).

Parameters

6.1 Parameters

Parameters of the PS 25W 24VDC

For parameter assignment of the module with STEP 7, you specify the properties of the module using various parameters. The table below shows the configurable parameters.

When the parameters are assigned in the user program, they are transferred to the module with the WRREC instruction (parameter assignment in RUN), see section Parameter data record [\(Page 34\)](#).

Table 6-1 Configurable parameters and their defaults

Parameters	Value range	Default	Parameter assignment in RUN	Integrated in the hardware catalog of STEP 7 (TIA Portal) as of V20 and V19 HSP 0452 or the PROFINET IO GSD file
Diagnostic/maintenance				
• Supply voltage missing	Yes/No	No	Yes	Yes
• Switch position Off	Yes/No	No	Yes	Yes
• Interrupt in case of abnormal input voltage	Yes/No	No	Yes	Yes

NOTE

Diagnostics alarms without supply voltage

Even when there is no supply voltage or when the On/Off switch is set to "Off", the power supply module of the CPU or the IM is supplied with enough voltage by the backplane bus that it can generate a diagnostics alarm. The entire diagnostic functionality is still available.

Interrupts, diagnostic alarms, error and status messages

7.1 Interrupts

What is a diagnostics interrupt?

The power supply module supports diagnostics and hardware interrupts. Detailed information on the event can be found in the error organization module with the "RALRM" instruction (read additional alarm information) and in the STEP 7 online help.

Triggers for diagnostics interrupts

Events that can trigger a diagnostics alarm can also trigger a diagnostics interrupt:

- Supply voltage missing
- Overtemperature
- Overvoltage on the backplane bus
- Low voltage/overload in the power segment
- Error in the power segment
- Switch position Off
- Supply voltage too low
- Supply voltage too high
- Malfunction

Responses to a diagnostics interrupt

You can find the CPU response to a diagnostics interrupt in the system diagnostics System diagnostics (<http://support.automation.siemens.com/WW/view/en/59192926>) Function Manual.

Detailed information on the error event is available in the diagnostics interrupt OB by executing the "RALRM" instruction (read additional interrupt information) and in the STEP 7 Online Help.

7.2 Diagnostic alarms

Diagnostics alarms

The following table shows the meaning of the diagnostics alarms and possible remedial measures for the respective cause.

Table 7-1 Diagnostics alarms, their meaning, and remedial measures

Diagnostic alarm	Error code		Meaning	Reaction	Remedy
	Dec.	Hex.			
External error					
Supply voltage missing	266 _D	010A _H	No supply voltage, or incorrect insertion of the power connector into the PS.	1	Check the supply voltage.
Internal error					
Overtemperature	5 _D	0005 _H	Overtemperature on the printed circuit board.	3	Check PS load. Isolate PS from mains. Wait one minute before you power on the PS again.
Overvoltage back-plane bus	267 _D	010B _H	High EMC interference or a defective PS, CPU or IM inserted.	3	Eliminate electromagnetic interference. Check inserted modules and bus connectors. Isolate PS from mains. Wait one minute before you power on the PS again.
Low voltage/overload in the power segment	281 _D	0119 _H	A voltage dip below the valid limit has been detected in the power segment to the right of the PS.	2	Check modules in affected segment and replace if necessary. Switch off PS at the switch and switch on again.
Error in the power segment	282 _D	011A _H	PS or module to the right of the PS is defective.	2	Replace the defective module. Switch off the PS at the switch, then switch on again.
Maintenance					
Switch turned off	268 _D	010C _H	The PS is switched off.	1	Switch on PS.
Supply voltage too low	804 _D	0324 _H	Input voltage of the power supply unit too low	4	Check PS input voltage.
Supply voltage too high	803 _D	0323 _H	Input voltage of the power supply unit too high	4	Check PS input voltage.
Malfunction					
Module is defective	256 _D	0100 _H	PS failure.	3	Replace PS.

External errors, internal errors and malfunctions

- External errors occur outside the PS. In the parameterization, specify whether or not an external error can trigger a diagnostics alarm. By default, external errors do not trigger diagnostics alarms.
- Internal errors occur inside the PS. If still possible, an internal error always triggers a diagnostics alarm.
- A malfunction is a static state; the PS must be sent in for repair. If still possible, a defect always triggers a diagnostics alarm.

Explanation of the responses

1. U plug: The power segment to the right of the PS is not supplied. This diagnostic message is only generated if the PS continues to be supplied from the left side via the backplane bus.

Active backplane bus: The system only generates a diagnostic message when other devices supply sufficient power to the backplane. No further measures will be taken.
2. The modules to the right of the PS are switched off. This condition only occurs in U-connector configurations.
3. The system only generates a diagnostic message if the PS continues to be supplied via the backplane bus. This is followed by the shutdown of the PS with locking behavior. After the fault has been rectified, the PS must be completely switched off for about 1 minute. After that, operations can be restored. Neither the input voltage nor the backplane bus are allowed to supply power during this period.
4. The input voltage is outside the specified range, but the PS continues to operate under abnormal conditions.

U plug: The modules to the right of the PS will continue to be supplied with power.

Active backplane bus: All modules on the bus will continue to be supplied with power.

7.3 Status and error displays

LED displays

The following figure shows the LED displays (status and error displays) of the PS 25W 24VDC.

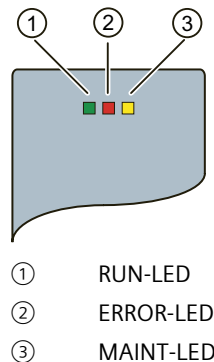


Figure 7-1 LED displays of the PS 25W 24VDC

Meaning of the LED displays

The following table explains the meaning of the status and error displays. You can find remedial measures for diagnostics alarms in the Diagnostic alarms [\(Page 26\)](#) section.

Table 7-2 Status and error displays RUN/ERROR/MAINT

LED			Meaning	Remedy
RUN	ERROR	MAINT		
□ Off	□ Off	□ Off	OFF, PS supplies no bus voltage - External error and diagnostics is not enabled - PS not supplied in the system, no supply voltage connected to the PS and no supply voltage connected to CPU/IM.	Supply PS with voltage Check supply voltage Switch on PS
■ On	□ Off	□ Off	Module is configured	
■ On	■ On	■ On	Startup, all LED displays illuminate briefly after system startup or module startup after firmware update.	-
☀ Flashing	□ Off	□ Off	Startup, PS supplies bus voltage, PS waiting for parameter assignment	-
□ Off	☀ Flashing	□ Off	Error, PS supplies no bus voltage - No supply voltage and diagnostics is enabled - Internal error	Evaluate diagnostics alarms and carry out appropriate remedial measures, see Diagnostic alarms (Page 26) section.
□ Off	□ Off	■ On	Maintenance demanded, PS supplies no bus voltage - Switch is off; supply is present and diagnostics is enabled - Input voltage too high/too low	Switch on PS Check power unit input voltage
☀ Flashing	☀ Flashing	☀ Flashing	Malfunction LED displays flash permanently	Replace PS

Compatibility

8.1 Compatibility of modules

The power supply module supports only TIA Portal V18 or higher versions with full function scope. If no new article number is listed in the hardware catalog, you can download the HSP from the internet. You can find more information here

(<https://support.industry.siemens.com/cs/ww/en/view/72341852>).

You can also configure the power supply module with article number 6ES7505-0KA00-0AB0 in the previous TIA Portal version (< V18). The following functions are then not available:

- Detection and reporting of abnormal voltages on the input line
- Diagnosis if the supply voltage is too low/high

You can use the current GSDML of the ET 200MP for the configuration. The new article number of the power supply module is then available and You can find more information here (<https://support.industry.siemens.com/cs/us/en/view/68189683>).

Technical specifications

The following table shows the technical specifications as of 12/2024. You will find a data sheet including daily updated technical specifications on the Internet (<https://support.industry.siemens.com/cs/ww/de/pv/6ES7505-0KA01-0AB0/td?dl=en>)

Technical specifications of the PS 25W 24VDC

Article number	6ES7505-0KA01-0AB0
General information	
Product type designation	PS 25W 24VDC
HW functional status	FS01
Firmware version	V2.0
FW update possible	Yes
Product function	
Voltage measurement	Yes; 19.2 ... 28.8 V DC ($\pm 2.5\%$)
Current measurement	Yes; 0 ... 1.67 A ($\pm 2.5\%$)
Power measurement	Yes; 0 ... 25 W ($\pm 5\%$)
I&M data	Yes
Engineering with	
STEP 7 TIA Portal configurable/integrated from version	STEP 7 V18 or higher with HSP 0458
STEP 7 configurable/integrated from version	STEP 7 V5.7 or higher SP1 or higher
PROFINET from GSD version/GSD revision	V2.45
Redundancy	
Redundancy capability	Yes
– for uprating	Yes
Installation type/mounting	
Rail mounting	Yes
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V; Static 19.2 V, dynamic 18.5 V
permissible range, upper limit (DC)	28.8 V; Static 28.8 V, dynamic 30.2 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Mains buffering	
Mains/voltage failure stored energy time	20 ms

Article number	6ES7505-0KA01-0AB0
Input current	
Current consumption, max.	1.6 A
Rated value at 24 V DC	1.3 A
Output current	
Short-circuit protection	Yes
Power	
Infeed power to the backplane bus	25 W
Power loss	
Power loss at nominal rating conditions	6.2 W
Interrupts/diagnostics/status information	
Status indicator	Yes
Potential separation	
primary/secondary	Yes
Isolation	
Isolation tested with	707 V DC (type test)
EMC	
Interference immunity against voltage surge	
Interference immunity on supply lines acc. to IEC 61000-4-5	Yes; ± 0.5 kV (acc. to IEC 61000-4-5; 2014; surge line to line), ± 1 kV (acc. to IEC 61000-4-5; 2014; surge line to earth), no external protective circuit required
Degree and class of protection	
IP degree of protection	20
Equipment protection class	III
product functions / security / header	
signed firmware update	Yes
Ambient conditions	
Ambient temperature during operation	
- min. - max.	-30 °C 60 °C
Altitude during operation relating to sea level	
Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	350 g

Dimensional drawing

A.1 Dimensional drawing

Dimensional drawing of the PS 25W 24VDC

This appendix includes the dimensional drawing of the power supply module mounted on a mounting rail and with shielding clamp. You must take into consideration the dimensions when mounting in cabinets, in switch rooms, etc.

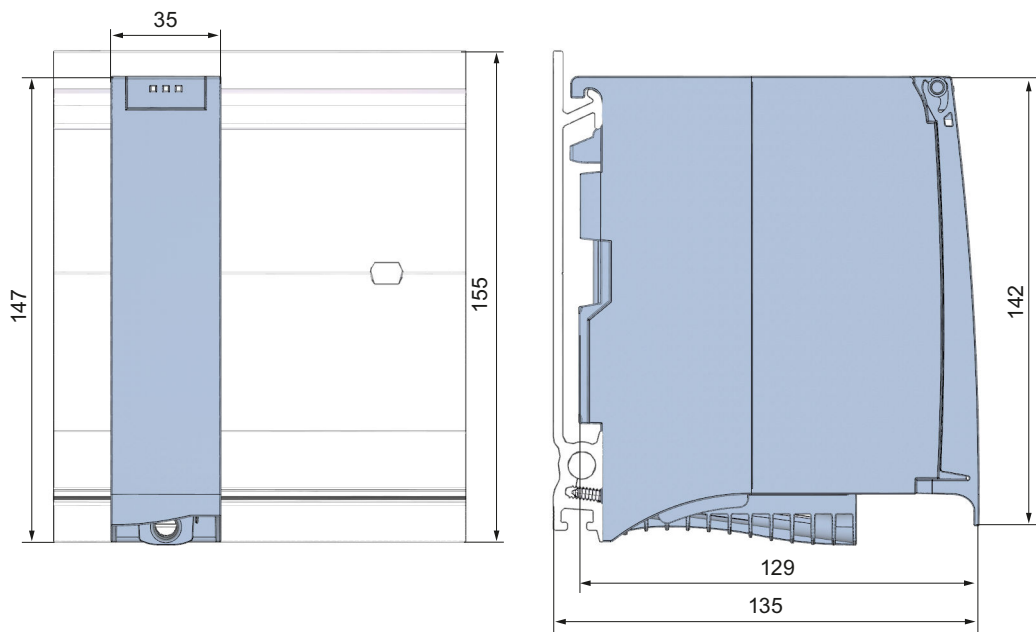


Figure A-1 Dimensional drawing of the PS 25W 24VDC module

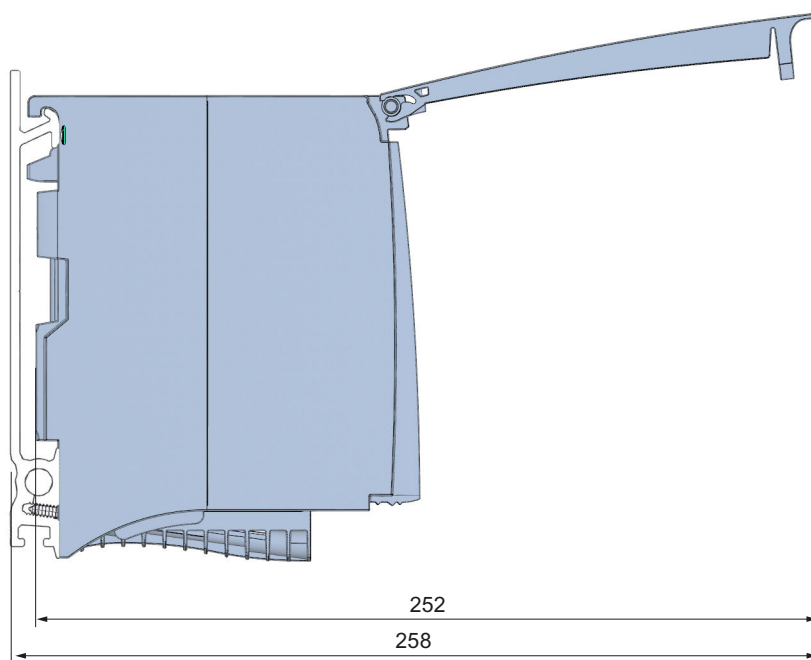


Figure A-2 Dimensional drawing of the PS 25W 24VDC module from side with open front cover

Parameter data record

Parameter assignment in the user program

You have the option to re-parameterize the power supply module in RUN mode of CPU.

Changing parameters in RUN mode

The WRREC instruction is used to transfer the parameters to the module using data records 0. The parameters set with STEP 7 are not changed in the CPU, which means that the parameters set with STEP 7 are valid again after a restart.

The parameters are only checked for plausibility by the module after the transfer to the module.

STATUS Output parameter

The module always checks all the values of the transferred data record. Only if all the values were transferred without errors does the module apply the values from the data record.

The WRREC instruction for writing data records returns corresponding error codes when errors occur in the STATUS parameter, see also the description of the "STATUS" parameter in the STEP 7 online help).

The following table shows the module-specific error codes and their meaning for the parameter data records.

Error code in STATUS parameter (hexadecimal)				Meaning	Remedy
Byte 0	Byte 1	Byte 2	Byte 3		
DF	80	E0	01	Unspecified error.	-
DF	80	E0	02	Wrong version in the header information.	Correct the version of the parameter blocks.
DF	80	E0	03	Wrong length in the header information.	Correct the length of the parameter blocks.
DF	80	E1	00	Unspecified error.	-

Data record structure

The figure below shows the structure of the data record 0.

- A fixed bit pattern is entered in byte 0. It indicates the version of the data record structure. Each time a data record is written, the module checks the written data and accepts only data records with major version 1.
- Byte 1 specifies the maximum data length that can be used for parameter data.

- Byte 2 contains the parameter data.
- Byte 3 to Byte 5 are parameters for detecting abnormal voltages.
- Byte 3 contains the tolerance for detecting abnormal stresses (range 1-20%, default value: 10 %).
- Bytes 4 through 5 contain the nominal voltage for detecting abnormal voltages (range: 85–300 V, default value: 230 V).

To enable a parameter in byte 2, set the corresponding bit to "1". The corresponding diagnostics is then enabled, for example, for supply voltage monitoring. If you set the corresponding bit to "0", the diagnostics is disabled.

You may not change byte 0 and byte 1.

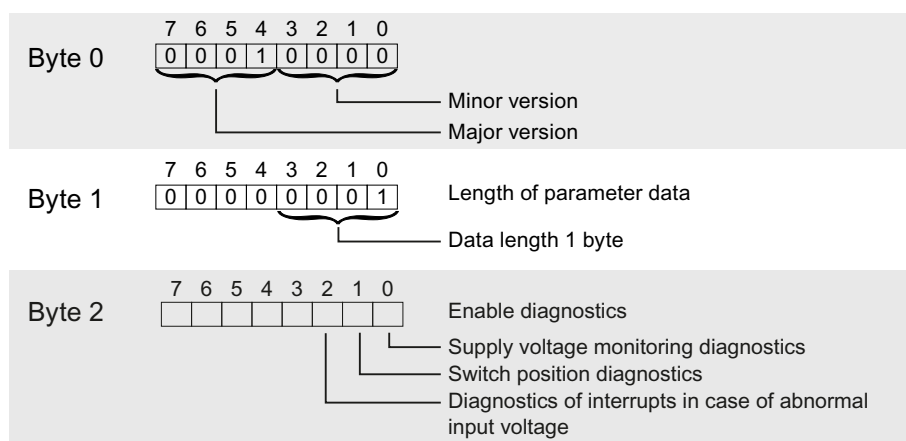


Figure B-1 Structure of data record 0

See also

[Detection and reporting of abnormal voltages on the 24 V input line \(Page 22\)](#)

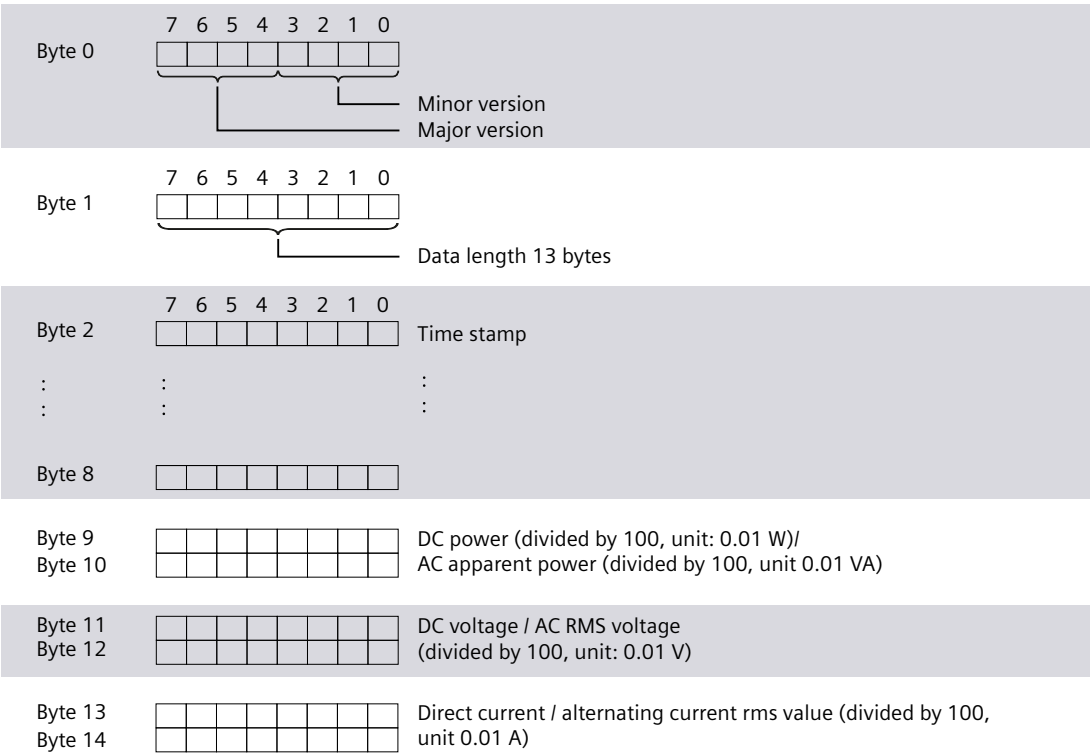
B.1 Data record 15 (read)

Data record 15 is used to process power information of the input cable. Use RDREC to receive the data.

The figure below shows the structure of data record 15.

- Byte 0: Version
- Byte 1: Data length
- Bytes 2 to 8: Time stamp
- Bytes 9 to 10: DC power (divided by 100, unit 0.01 W) / AC apparent power (divided by 100, unit 0.01 VA)
- Bytes 11 to 12: DC voltage / AC RMS voltage (divided by 100, unit: 0.01 V)
- Bytes 13 to 14: Direct current / alternating current rms value (divided by 100, unit: 0.01 A)

B.2 Data record 16 (read)

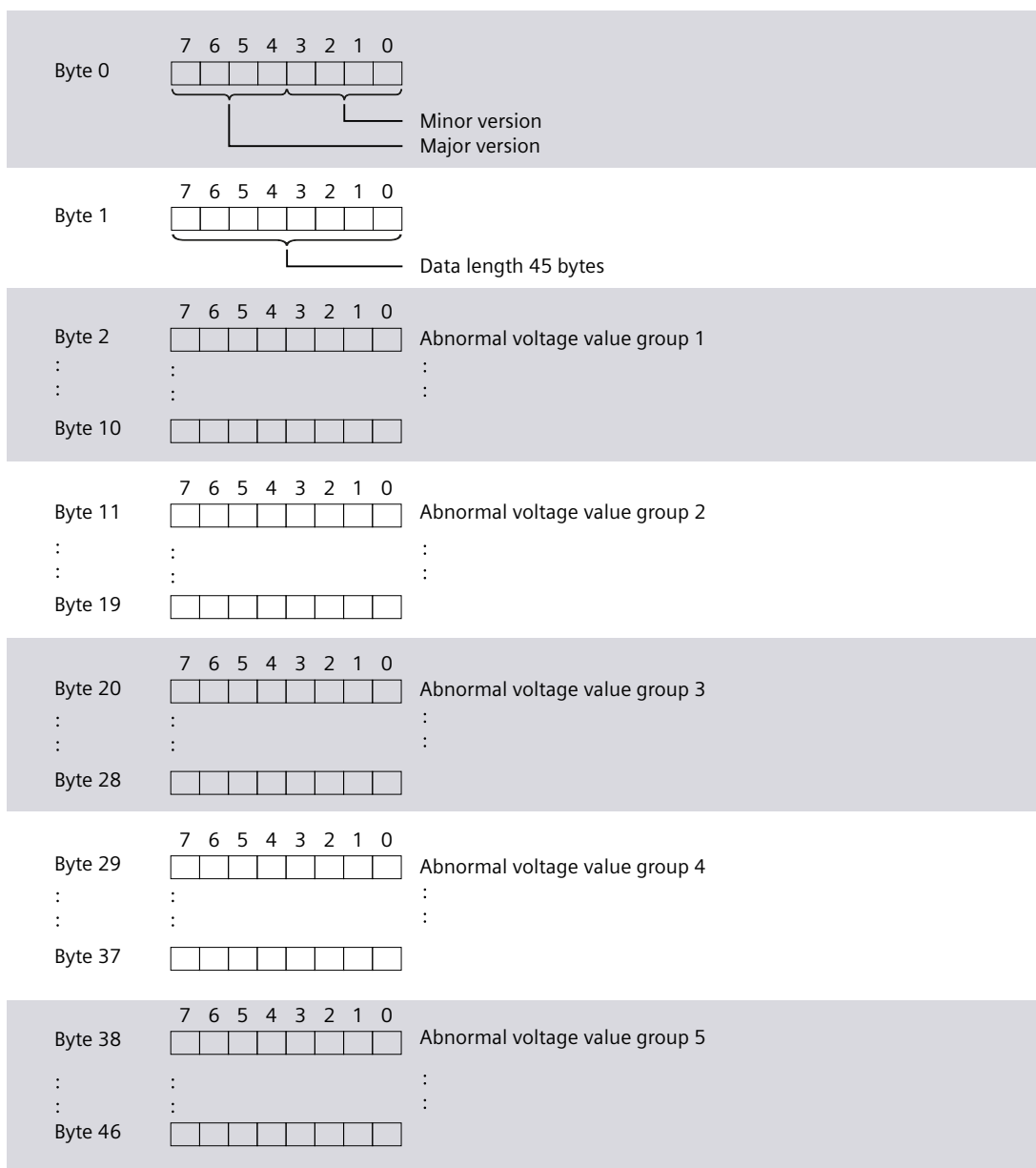


B.2 Data record 16 (read)

Data record 16 is used to process information about abnormal voltages on the input cable. Use RDREC to receive the data.

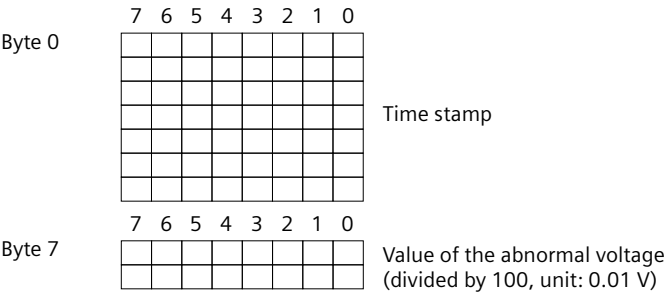
The figure below shows the structure of data record 16.

- Byte 0: Version
- Byte 1: Data length
- Bytes 2 to 10: Abnormal voltage value group 1
- Bytes 11 to 19: Abnormal voltage value group 2
- Bytes 20 to 28: Abnormal voltage value group 3
- Bytes 29 to 37: Abnormal voltage value group 4
- Bytes 38 to 46: Abnormal voltage value group 5



Structure of the value group for abnormal voltages

The figure below shows the structure of the value group for abnormal voltages. The structure of the time stamp can be found here [\(Page 40\)](#).

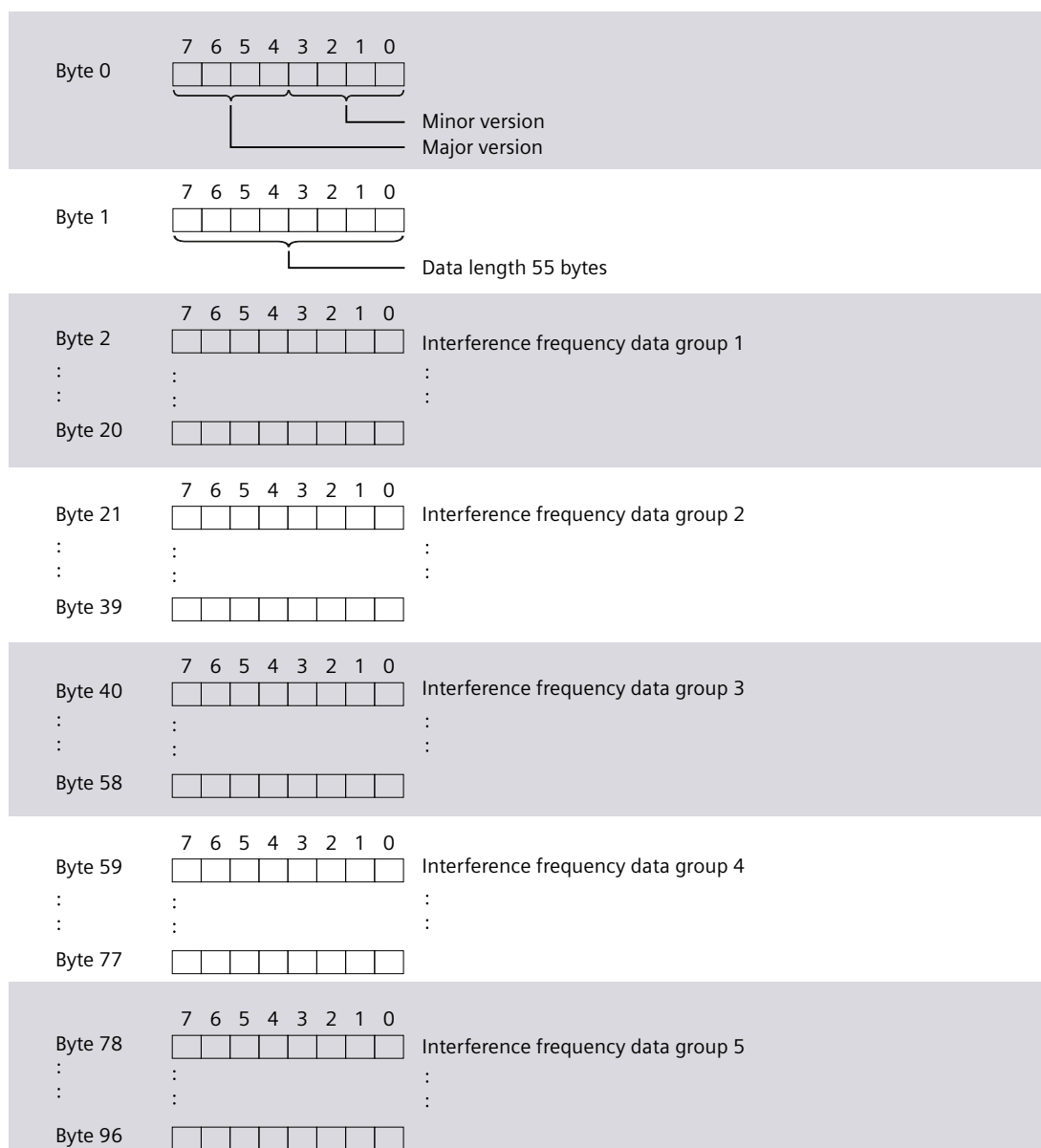


B.3 Data record 17 (read)

Data record 17 is used to record information about interference frequencies. Use RDREC to receive the data.

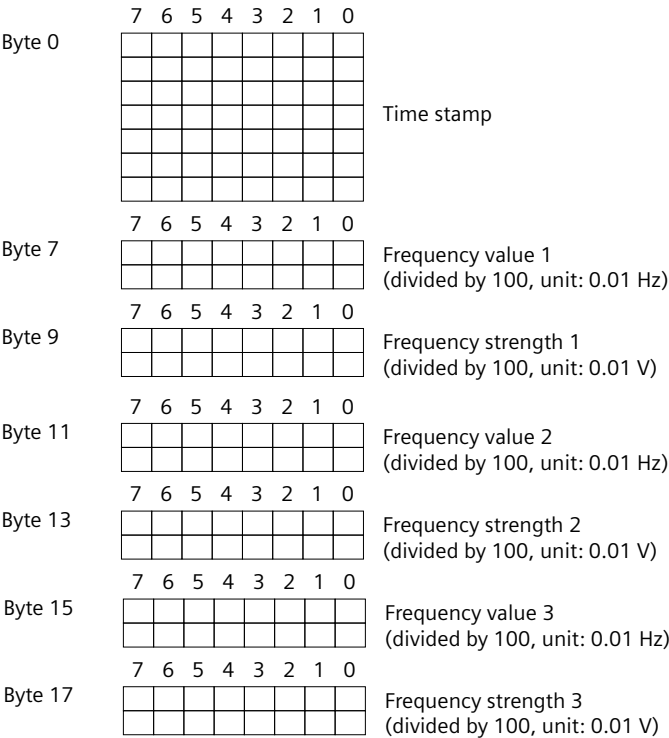
The figure below shows the structure of data record 17.

- Byte 0: Version
- Byte 1: Data length
- Bytes 2 to 20: Interference frequency information group 1
- Bytes 21 to 39: Interference frequency information group 2
- Bytes 40 to 58: Interference frequency information group 3
- Bytes 59 to 77: Interference frequency information group 4
- Bytes 78 to 96: Interference frequency information group 5



Structure of the interference frequency information group

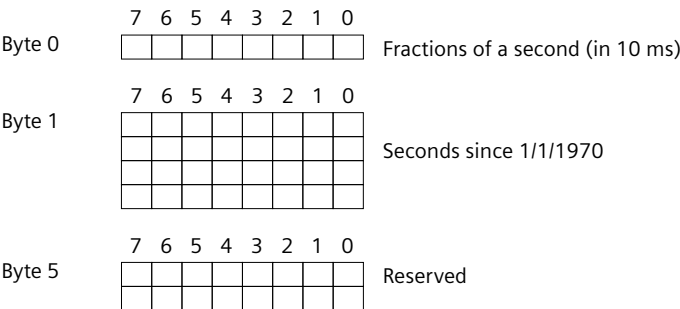
The figure below shows the structure of the interference frequency information group for frequency value and strength. The structure of the time stamp can be found here [\(Page 40\)](#).



B.4 Time stamp data structure

The current date and time are recorded in the time stamp. Note that the time stamp is only valid if the power supply module is configured in the central structure and the CPU time is calibrated.

The figure below shows the structure of the time stamp.



Approvals

C.1 Approvals

This section lists the approvals that apply specifically to the PS 25W 24VDC power supply module.

Detailed information on additional approvals for the PS 25W 24VDC power supply module can be found in the S7-1500/ET 200MP

(<https://support.industry.siemens.com/cs/ww/en/view/59191792>) system manual.

NOTE

Information located on the power supply module PS 25W 24VDC

The currently valid markings and approvals are printed on the components of the PS 25W 24VDC power supply module.

IECEX

The PS 25W 24VDC power supply module meets the requirements for use in potentially explosive atmospheres in accordance with IECEx.

IECEX classification: Ex ec IIC T4 Gc

IECEX certificate: IECEx UL 25.0033X

The PS 25W 24VDC power supply module meets the requirements of the following standards:

- IEC 60079-0
Potentially explosive atmospheres – Part 0: Equipment – General requirements
- IEC 60079-7
Explosive atmospheres – Part 7: Equipment protection through increased safety "e"

Special conditions in hazardous areas:

- The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC 60664-1.
- The device must be installed in a suitable housing that ensures at least IP54 degree of protection according to IEC 60079-0. The ambient conditions must be taken into consideration for use.
- Transient protection that is set to a maximum value of 140% of the peak value of the nominal voltage at the supply terminal of the devices must be provided.

ATEX



The PS 25W 24VDC power supply module meets the requirements of EU Directive 2014/34/EU (ATEX) "Equipment and protective systems intended for use in potentially explosive atmospheres"

Applicable standards:

- EN IEC 60079-0
Potentially explosive atmospheres – Part 0: Equipment – General requirements
- EN IEC 60079-7
Explosive atmospheres – Part 7: Equipment protection through increased safety "e"

The current versions of the standards can be found in the above EU Declaration of Conformity.

ATEX approval: II 3 G Ex ec IIC T4 Gc

Certificate number: UL 25 ATEX 3382X

Also observe the notes in the product information "Use of modules in a Zone 2 hazardous area". You can find the document in the following Internet entry (<https://support.industry.siemens.com/cs/ww/en/view/78381013>).

UKEX approval



Special conditions in explosive atmospheres:

- The equipment shall only be used in an area of not more than pollution degree 2, as defined in EN 60664-1.
- The equipment shall be installed in a suitable enclosure providing a degree of protection not less than IP54 in accordance with EN IEC 60079-0. The ambient conditions must be taken into consideration for use.
- Transient protection that is set to a maximum value of 140% of the peak value of the nominal voltage at the supply terminal of the devices must be provided.

System power supplies (PS):

According to EN IEC 60079-7 (Electrical apparatus for potentially explosive atmospheres - Part 7: Increased safety "e") and EN IEC 60079-0 (Electrical apparatus for potentially explosive gas atmospheres - Part 0: General requirements).

II 3 G Ex ec IIC T4 Gc

UL25UKEX3016X

c(UL)us



Applicable standards:

- Underwriters Laboratories, Inc.: UL 61010-1 (Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements)
- UL 61010-2-201 (Safety requirements for electrical equipment for measurement, control and laboratory use. Particular requirements for control equipment)
- Canadian Standards Association: CAN/CSA-C22.2 No. 61010-1-12, CAN/CSA-C22.2 No. 61010-2-201

Report / UL file: E472609

cULus Hazardous (Classified) Locations



Underwriters Laboratories Inc. in accordance with

- UL 508 (Industrial Control Equipment) **OR** UL 61010-1 and UL 61010-2-201
- CAN/CSA C22.2 No. 142 (Process Control Equipment) **OR** CAN/CSA C22.2 No. 61010-1 and CAN/CSA C22.2 No. 61010-2 201
- ANSI/ISA 12.12.01 **OR** UL121201
- CAN/CSA C22.2 No. 213 (Hazardous Location)

APPROVED for use in

- Class I, Division 2, Group A, B, C, D T4
- Class I, Zone 2, Group IIC T4

Report / UL file: E472610

Installation Instructions for cULus haz.loc.

- This device is a open-type device and is meant to be installed in an enclosure suitable for the environment and where the device is only accessible with the use of a tool.
- This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, Group IIC; or non-hazardous locations.
- WARNING - Explosion Hazard - Do not disconnect while circuit is live unless area is known to be non-hazardous.
- WARNING - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2 or Zone 2.
- Temperature code (T-code) - T4
- Ambient temperature range:
 - Vertical mounting: -30 °C to 40 °C
 - Horizontal mounting: -30 °C to 60 °C

WARNING: EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE RELAYS.

FM



Factory Mutual Research (FM) according to

- Approval Standard Class Number 3611, 3600, 3810
- ANSI/UL 121201
- ANSI/UL 61010-1
- CAN/CSA C22.2 No. 0-10
- CAN/CSA C22.2 No. 213
- CAN/CSA C22.2 No. 61010-1

APPROVED for use in Class I, Division 2, Group A, B, C, D Tx;

Class I, Zone 2, Group IIC T4

Installation Instructions for FM

- WARNING - Explosion Hazard - Do not disconnect while circuit is live unless area is known to be non-hazardous.
- WARNING - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2 or Zone 2.
- This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, Group IIC; or non-hazardous locations.
- WARNING: EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE RELAYS.

Certification for Korea



This product meets the certification requirements for Korea.

Approval number: R-R-S53-S71500

Please note that this device corresponds to limit value class A in terms of the emission of radio frequency interference. This device can be used in all areas, except residential areas.

이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며 가정 외의 지역에서 사용하는 것을 목적으로 합니다.

Index

O

Open Source Software, [14](#)
Use, [15](#)